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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,210	09/22/2003	Hidekazu Sato	031179	5736
23850	7590	09/22/2004	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP 1725 K STREET, NW SUITE 1000 WASHINGTON, DC 20006			HO, TU TU V	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,210

Applicant(s)

SATO ET AL.

Examiner

Tu-Tu Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 2,3,5,8,10 and 12-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,6,7,9 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/22/2003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on 09/22/2003 is acceptable.

Specification

2. The title of the invention is not descriptive (there are more than 300 thousands patented inventions and patent application publications with "semiconductor device" in the title and 750 thousands with "semiconductor" in the title). A new title is required that is clearly indicative of the invention to which the claims are directed. The examiner suggests that the title be changed to "Bipolar Transistor" or "Semiconductor Device Having Collector".

Election/ Restriction

3. Applicant's election without traverse of Species I of Group I, claims 1, 4, 6, 7, 9, and 11, in Paper filed 09/02/2004 is acknowledged. Accordingly, claims 2-3, 5, 8, 10, and 12-25 are withdrawn from consideration.

Claim Rejections

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

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(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 4, 6, 7, 9, and 11** are rejected under under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Oda et al. U.S. Patent 6,482,710.

Oda discloses in Figure 5C and respective portions of the specification a semiconductor device substantially as claimed.

Referring to **claim 1**, Oda discloses a semiconductor device, comprising:

a semiconductor substrate (1) having a collector (18) formed thereon;
insulation films (7/8) formed on said semiconductor substrate, said insulation films having an opening (defined by film 14/15) formed on a portion that corresponds to the collector (18);

a conductive film (9) formed on said insulation films (7/8);

a semiconductor film (14/15) formed inside the opening, a portion (center region of portion 14) in contact with the collector (18) of said semiconductor film being formed of single crystal (column 10, lines 5-14), a portion (15) in contact with said conductive film (9) of said semiconductor film being formed of polycrystal (column 10, lines 5-14); and

an emitter (20/19) formed on said semiconductor film.

However, Oda fails to explicitly disclose that the portion (15) in contact with said conductive film (9) being one to two times as thick as the portion (14) in contact with the collector (18). Nevertheless, as can be seen from Fig. 5C, the portion (15) in contact with said conductive film (9) appears to be one to two times as thick as the portion (the central region of portion 14) in contact with the collector (18). Note also that portions 14 and 15 are formed in the same process (column 10, lines 5-14) and that an upper surface of the central region of portion 14 contacts layer 20 whose upper surface is planar with an upper surface of the outer regions of portion 14 which is thinner than portion 15, thereby causing the appearance that the portion (15) in contact with said conductive film (9) being one to two times as thick as the portion (14) in contact with the collector (18).

Referring to **claim 4**, Oda further discloses that said semiconductor film (14/15) is a film comprising at least a film selected from a group including an SiGe composed crystal film (crystal silicon germanium, column 10, lines 5-14) and an SiGeC composed crystal film.

Referring to **claim 6**, Oda further discloses that said conductive film (9) is a film selected from a group including a polycrystalline silicon film (column 8, lines 25-30) and an aluminum film.

Referring to **claim 7**, although Oda does not disclose that said insulation film (7/8) is a silicon oxide film, Oda discloses that insulation film 7/8 comprises a silicon oxide film (column 8, lines 24-26). Since either a silicon-oxide insulation film as claimed or an insulation film comprising a silicon oxide film as disclosed by Oda functions as an insulation film, the change from one to the other would have been obvious at the time the invention was made.

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Referring to **claim 9**, Oda further discloses a second insulation film (10 or 17) that insulates between said conductive film (9) and the emitter (20/19).

Referring to **claim 11**, Oda further discloses that said second insulation film (10 or 17) is a film selected from a group including a silicon oxide film (column 8, lines 29-30) and a silicon nitride film.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TH

Tu-Tu Ho
September 15, 2004